

large work, reviewed in this journal on March 3. The act is regarded as one of harmonising the discrepancies that arise through specialisation of chromatic and motor organs in the male, and of assimilative structures in the female.

In conclusion, we have to regret the absence of an index or of a list of references, but we may recommend the work as an extremely useful and compact summary of recent work on the physiology of the protozoa.

AMATEUR ASTRONOMY.

An Easy and Concise Guide to the Starry Heavens, arranged as a Companion to the Umbrella Star Map and Revolving Star Dome for Instruction in Astronomy. By D. McEwan. Pp. 137. (London: Kegan Paul, Trench, Trübner and Co., Ltd., 1910.) Price 5s.

THE idea of using the concave surface of an umbrella as a star map is excellent, but, of course, not new. The portability and convenience of manipulation of such a stellar guide are obvious advantages, while the aspect in which the constellations are seen, unlike the view in a celestial globe, corresponds to the reality. The actual construction of such a chart of the sky might quite well form part of the practical work of every elementary course of astronomy.

A simple guide to the heavens, to be used in conjunction with, and in explanation of, such an adapted umbrella should be worthy of notice. It is to be regretted that the present book, while pretending and seeming at the first glance to fulfil just such a function, cannot be recommended. Somewhat scrappy and not always trustworthy, it gives the impression of being the work of an amateur.

After a preface and an introduction, chapter i. devotes a page and a half to astronomical magnitudes and units, and also describes a chart of the north circumpolar stars, which is reproduced. The stars contained in the various "segments" of the "Umbrella Star Map" are dealt with in chapter ii. The persistently misnamed "segments" are really the sectors formed by the ribs and circumference of the umbrella. In the text a certain amount of information is given about the constellations and the principal stars as they occur in each "segment," while charts show their relative positions and make a very rough attempt to indicate stellar magnitudes. The scheme to represent magnitude described for the actual umbrella is not in use, apparently, in the companion book. A separate key-map in each case is used to indicate names. A table, giving for each star a serial number, the Greek letter, constellation, magnitude, right ascension, and declination, completes the information for a typical "segment." General astronomical information is introduced relative to special objects as they are encountered, so that, without reference to the index, it is difficult to find the treatment of any particular subject.

The information given is often amateurish and sometimes in error, while plausible misstatements which would trouble a beginner are to be found. The solar spectrum, for example, is "well known to consist of the seven colours," while by observations

made through a long tunnel, or from the bottom of a well, "any star coming into the field of view would be seen even in daylight." Under the title "Major Planets" are described Jupiter, Saturn, Uranus, and Neptune, while the "Minor Planets" are Mercury, Venus, and Mars. To Jupiter is ascribed only five moons, the date of discovery of the fifth being given.

Chapter iv. describes a folding key to the "Umbrella Star Map," and the next chapter deals with the solar system in a bald way. In the pages devoted to time, the sun is described as being due east at six o'clock, while amplitude is misdefined in the following chapter.

A section devoted to scouting and an index to constellations bring to a conclusion a book which needs a thorough revision if it is to be of service.

ELEMENTS OF PHYSICS.

(1) *A First Book of Physics.* By Dr. L. Lownds. Pp. vii+145. (London: Macmillan and Co., Ltd., 1910.) Price 1s. 6d.

(2) *An Elementary Text-book of Physics.* Part IV., Heat. By Dr. R. W. Stewart. Pp. iv+246. (London: C. Griffin and Co., Ltd., 1910.) Price 3s. 6d. net.

(3) *Matriculation Magnetism and Electricity. A Text-book for Use in Schools and Colleges arranged for Modern Methods of Teaching.* By Dr. R. H. Jude and J. Satterly. Pp. vii+415. (Cambridge: University Tutorial Press, Ltd., 1910.) Price 4s. 6d.

(1) THIS book is intended for those beginning the study of physics. The contents do not cover the whole ground usually dealt with, but are confined to the principles of measurement, mechanics, and heat. The reason given for this is that it is now customary in secondary schools to limit the courses of study to these subjects for the first two years. Students reading this book are expected to be acquainted with the elements of mathematics, and to be able to perform for themselves the numerous experiments described in the text. Descriptive and numerical test questions form the conclusion of each chapter.

There is no doubt it will be found a very useful book. The most pleasing feature is the exactness with which statements are made, at the same time preserving great simplicity of language. Added to this, the printing and diagrams are good, and advantageous use is made of heavy type for the more important statements of principles.

(2) Dr. Stewart's fourth volume is written in much the same style as the three preceding ones. It is suitable for those possessing no previous exact knowledge of the subject of heat. Attention is paid to all the elementary thermal phenomena, the order of treatment being the usual one. What has been said above in reference to Dr. Lownds's book applies also here. Few difficulties should present themselves to an earnest reader of the subject. Here also many experiments are described, but, with the exception of a few worked in the text, examples are absent.

There is rather a surprising omission, however, in the chapter on the transference of heat by radiation.

Although the essential similarity of light and radiant heat is insisted upon, and the distinction between heat and radiant heat clearly drawn, no experiments to illustrate the application of the laws of reflection to the latter are given. The experiment with two concave mirrors in which heat is transferred by radiation from one focus to the other is surely one of the best for impressing on students the connection between the various radiations.

(3) This much longer volume is not nearly so good as those just commented upon. It is written specifically for the London matriculation examination, and it may be said at once that it is much too difficult. It would have been better if less material had been treated more fully. As it is, the book is overcrowded with statements which it would be impossible for the elementary student to deduce for himself—he must merely commit them to memory. He is told, for instance, that the “dyne” is the weight of one gram divided by 981, a statement which is not only incorrect, but conveys no impression of the importance of the absolute unit of force. A long discussion is entered upon as to the relative merits of the two-fluid and one-fluid theories of electricity. The matriculation student is advised in the text to accept the one-fluid theory, and then a footnote tells him that probably he will have to revert to the two-fluid theory because recent experiments point to the existence of positive electricity. Controversies of this kind are altogether out of place in elementary text-books; they only confuse the student.

There is a profusion of examples at the end of each chapter. These are, as a whole, good; but it is doubtful whether the pupil would be in a position to answer them intelligently if left to himself.

OUR BOOK SHELF.

Studien über die Bestimmung des weiblichen Geschlechtes. By Prof. Achille Russo. Pp. v+105. (Jena: Gustav Fischer, 1909.) Price 3 marks.

PROF. RUSSO has published a general account of very interesting experiments which he has made on the determination of the female sex in rabbits. His method was to dose the animals with lecithin—a well-known constituent of yolk of egg—administering it in various ways. He injected it into the peritoneal cavity or subcutaneously; he even introduced it through the mouth. From control experiments it seemed clear that one of the results of introducing the lecithin in considerable quantity into the system, where it normally occurs in many different tissues, was the accumulation of deutoplasmic material in the ovarian follicles and in the oocytes; and Russo found that rabbits treated in this way, and subsequently mated, had more female than male offspring. Sometimes all the offspring were female. The security of the conclusion that the lecithin treatment was the condition of this disproportionate number of female offspring depends on the number of cases investigated and on the avoidance of selected stocks. Russo is well aware of this, and he does not betray any dogmatism.

In the normal ovary, or in what he believes to be the normal ovary, Prof. Russo distinguishes two kinds of ova, one kind rich in nutritive material deposited in the zona pellucida and in the vitellus, the other kind with little or none. The lecithin

treatment increases the number of the richly equipped, highly anabolic ova, and they are (if the correlation has been adequately substantiated) the female-producing ova.

In young rabbits of five or six months the ova show little vitelline material, no chromidial corpuscles, and a clear zona pellucida. This is a sign of deficient nutrition, and there is some evidence that these very young ova tend to be male-producing. As the nutrition of the ovary improves with age, the ova become better equipped with “embryoplasmic” material, and tend to be female-producing. The general result of Prof. Russo’s interesting experiments is to show that the ovary is a very plastic organ, responding to the lecithin treatment by an increase in the number of female-producing ova. He suggests that the lecithin treatment of males may affect the spermatozoa in an analogous way—in their mitochondrial apparatus. In developing his thesis, the author communicates many valuable observations on the germinal epithelium, the granulosa, the zona pellucida, and the various chromatic substances which appear in the ooplasm. Statistics of the experiments and details as to methods employed are duly submitted, and the whole discussion is conducted in an admirable scientific temper.

Report on the Mines and Mineral Resources of Natal (other than Coal). By Dr. F. H. Hatch. Pp. xii+155+vii plates. Published by order of the Natal Government. (London: Printed by R. Clay and Sons, Ltd., 1910.)

THIS little volume, which contains the results of an eight months’ prospecting trip in the colony of Natal, undertaken by Dr. Hatch on behalf of the Natal Government, is extremely disappointing, as the only conclusion that can be drawn from it is that Natal possesses no mineral, other than coal, that is deserving of any serious attention. Dr. Hatch sums up his impression in the words, “no large well-developed metal mines, either of the precious or of base metals, exist in Natal.” To which may be added that the report indicates that no deposit has yet been met with which promises to be worth developing or to be likely to be mined with any measure of success, and the same is true of the non-metallic deposits—coal, of course, being always excepted. Deposits of gold, copper, tin, iron, manganese, chromium, lead and silver, molybdenum, of limestone, phosphate, graphite, asbestos, gypsum, salt, nitrate, oilshale and petroleum, building stone, slate, clay, &c., are known to exist and have here been reported on, but nothing of commercial value seems to have been met with anywhere. The value of the mineral output of Natal for 1908 is given as 741,158*l.*, out of which the value of the coal is 737,169*l.* Further comment is needless.

Modelling from Nature. A New and Original Method of Clay Modelling. By Lilian Carter. Pp. 32; and 16 plates of models copied from nature. (London: Cassell and Co., Ltd., n.d.) Price 1*s.* 6*d.* net.

THOUGH we are sceptical as to the newness and originality of Miss Carter’s method of teaching clay modelling, there is no doubt that work of the kind she describes interests young children, and assists in making them accurate and alert in examining natural objects, as well as deft with their fingers.

The Time of the Singing of Birds. Pp. 126. (London: Henry Frowde, 1910.) Price 3*s.* 6*d.* net.

THIS anthology of verse will appeal to all bird-lovers. Three compilers have been able, with the cooperation of authors and publishers, to bring together a charming collection of modern poems, as well as the better known older verses dealing with bird life.